# Health and social care professions and mental ill-health among the workforce: An analysis using administrative data

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# Mental ill-health among health and social care professionals: an analysis using administrative data

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**Abstract**

**Objective**

Health and Social Care (HSC) workers are at high risk of job-related stress, *burnout* and mental ill-health. This study examines differences in self-reported mental health and psychotropic medication uptake across HSC occupational groups.

**Method**

Northern Ireland (NI) data linkage study of people working in the Health and Care sector, aged between twenty and sixty-four years, enumerated at the 2011 Northern Ireland Census and living in private households, and their uptake of prescribed psychotropic medications during 2011-2012 (using data derived from routine electronically captured information on prescriptions issued within the NHS and linked at an individual level using a NI-specific Health and Care key identifier). Comparing HSC workers with all those professionals not involved in HSC occupations, we used multinomial logistic regression to examine (a) self-reported chronic mental illness and (b) uptake of psychotropic medication by occupational groups adjusting for age, sex and socio-demographic circumstance.

**Results**

When compared against *other* professionals highest risks for mental health problems (associated with psychotropic prescription uptake) were associated with nursing/midwifery (OR = 1.25: 95%CI = 1.17–1.33; OR = 1.84: 1.58–2.15 for females and males respectively), welfare (OR = 1.34: 1.21–1.48; OR = 1.71: 1.44–2.03) and formal caregiving roles (OR = 1.42: 1.31–1.53; OR = 1.70: 1.50–1.91), again for females/males respectively). These higher risk professions record notable increases in psychotropic medication use.

**Conclusion**

Working in the Health and Social Care sector, irrespective of gender, may be more stressful than other jobs. Additionally, self-reported mental ill-health and psychotropic medication treatment both appear to be associated with social class inequity.

**Keywords**

health and social care; anxiety; depression; burnout; stress

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# Introduction

## Health and social care professional stress

While employment is generally important for psychological health and well-being [1–3], some jobs and aspects of work can be challenging, leading to poor mental health [4]. Occupational wellbeing has received growing attention from government and the media [5], and medical and social care staff may be particularly vulnerable [5, 6]. International evidence suggests that healthcare professionals are more likely to be exposed to long working hours, night work or shift work and may frequently experience sleep disturbance [7]. Prolonged work-related stress, experienced by between 30% and 40% of healthcare staff [8], can lead to burnout and is associated with depression, anxiety and sleep disorders [9]. Additionally, poor support from management, bullying and low autonomy all contribute to distress [7].

In the job-strain model, high strain jobs, highly demanding but with limited personal operational control, impact most negatively on health [10]. Support from colleagues, managers or personal relationships may modify the effect of high strain work [11]. Other theories suggest that health is impacted by an imbalance between work efforts and rewards [12] with consequent demoralisation and feelings of injustice [13]. Additionally, overcommitment to a job may also be harmful [14, 15].

Jobs with considerable public contact including formal caring may be particularly stressful [16, 17]. The current consensus is that caregiving is associated with poorer mental health and informal caregivers tend to demonstrate higher levels of stress and a higher prevalence and incidence of depression [18]. The British Psychiatric Morbidity Study (N = 3425) [3] found that personal service occupations had the greatest risk of common mental disorders (CMD) for both men and women, but that psychosocial work characteristics were not associated with CMD in these groups. While social class may partly explain high rates of CMD, the emotional labour involved with this type of role may also contribute [3].

Social disadvantage may partly confound the association between work and mental health. A better understanding of work as a determinant of well-being requires adjustment for potential confounding factors such as socioeconomic status, education, health behaviours, housing circumstances and satisfaction with personal time that may explain these associations [19].

## Research objective

General practitioners (GPs) are responsible for diagnosing and treating most people with comorbid depression and anxiety, frequently prescribing benzodiazepine and antidepressant medications [20]. In the past, obtaining accurate population estimates of the rates of psychotropic drug use has been difficult, and the applicability of existing literature is limited due to small or highly selected samples [21]. In this study we examine: (a) self-reported mental health and (b) prevalence and frequency of psychotropic medication use among health and social care (HSC) occupational groups relative to other professional occupations.

# Method

This study is part of a recent Administrative Data Research initiative, funded by the United Kingdom (UK) Economic and Social Research Council (ESRC), to develop the use of routinely collected administrative data for research purposes. In this instance the population of interest is drawn from the Northern Ireland (NI) 2011 Census enumerated population. While the general mechanisms involved in evolving and building the database spine (in this case the whole enumerated 2011 Census population) are detailed elsewhere [22, 23], the data linkages for this study include both this and electronically captured data on medications prescribed through Primary Care and dispensed by pharmacists, data gathered initially for pharmaceutical audit [22] and held on the Business Services Organisation (BSO) Enhanced Prescribing Database (EPD). The databases are managed and maintained by the Northern Ireland Statistics and Research Agency (NISRA): all data is classed as confidential; is held in, and accessed from, a *secure setting*; by *accredited* researchers, each of whom must adhere to stringent protocols obviating disclosure issues; and using data *de-identified* prior to researcher access.

## Study population

Full-time employed persons in the NI Health and Social Care (HSC) workforce at the time of the 2011 Census.

Two outcome measures indicating aspects of mental ill-health were derived: (1) from the census, whether someone has recorded an *emotional or mental health condition that has lasted (or is expected to last) for at least twelve months* (no/yes); and the number of prescriptions for psychotropic medication received in the twelve months following the census. We identified those who were administered a mental health prescription during 2011/12, as indicated from Enhanced Prescribing Data 2011/2012. We examine individuals who were prescribed medication in the following BNF categories in the 12-month period from April 2011 to March 2012: BNF 4.1, 4.2 and 4.3: hypnotics and anxiolytics; drugs used in psychoses and related disorders; and anti-depressants. HSC professions were classified according to Standard Occupational Classifications (SOC) [24] and specifically minor occupational units were identified based on three digit SOC codes. Sociodemographic characteristics were derived from census information: age (in five-year age bands); gender; marital status (coded as married; not married; or widowed, separated & divorced); and whether or not in a lone parent household (no/yes); locale of residence (urban, intermediate or rural). The census includes a question on any informal care provided (excluding care carried out as part of a job), we defined a binary outcome (informal carer status = no/yes). Because NI is typically ethnically homogenous, ethnicity was coded as binary (white, non-white). While occupational characteristics are addressed directly in the definitions of the populations of interest, other aspects of broadly socioeconomic circumstance are represented through three proxies, each recording different aspects of social structure and included because of their established place in social epidemiology: educational attainment (coded as no formal qualifications, intermediate level, degree-level); household car availability (two or more cars, one only, no cars); and housing tenure

(owner-occupation, renting). This latter was combined with information on property values, originally utilised for local taxation purposes to derive a meaningful six-fold gradation of household rental/owner occupation (see Table 2).

## Analysis

Analysis was confined to the working-age population, aged 25–59 and 25–64 years for women and men respectively. Descriptive statistics outline the distribution of self-reported mental ill-health and psychotropic treatment for mental ill-health across the included explanatory factors. Separate gender-stratified logistic regression models fully adjusted for all the noted factors are presented for each of the outcome variables (self-reported mental health problems and psychotropic medication).

## Results

The study population included 109,627 persons aged between twenty and fifty-nine (women), and twenty and sixty-four (men) in the 2011 Census: 61,639 females and 47,988 males, of whom 33,338 (54.1%) and 9,702 (20.2%) respectively were employed in the Health and Care (HSC) Sector. For both groups the residual populations comprised a reference group of professionals not involved in health and care (Table 2). Overall, 1.93% (n = 2,116) of people working in the HSC sector self-reported chronic mental health problems at census, and 15.18% (n = 16,639) psychotropic drug use for a common mental disorder (Table 1). In most cases, relative to the reference population, those in the HSCare sector were more likely to obtain psychotropic medication.The frequency of psychotropic drug use is higher among those in *nursing* (19.47%: n = 2,459), *welfare* (20.22%: n = 775), *formal caring* (26.49%: n = 3,933) and *management* (21.83%: n=222) roles than the other occupation groups. These groups also record higher levels at ten or more prescriptions: 4.71%, 5.14%, 7.25% and 4.92% respectively for each. However, HSC managers are, in absolute terms, a very small group within this sector.

Table 2 reports both the numbers (and proportions) of the various sub-populations of interest in the study, and the Odds Ratios (ORs) associated with self-reported mental health problems and psychotropic prescription receipt. Models are stratified by gender and fully adjusted for socio-demographic and socio-economic associations and HSC occupation type (with this indicator the reference group comprises all those in full-time employment in professional occupations other than in HSC occupations). A number of the cells in the frequency columns were classed by the data custodians as disclosive. To obviate this problem we had to remove the equivalent cells from male/female frequencies.

Self-reported mental health problems were higher in females working in a formal welfare role (OR = 1.35: 95%CI = 1.04–1.74). As expected, excess likelihood for receipt of psychotropic medication were recorded for both males and females employed in *nursing*, *welfare* and *formal caregiving* roles. Males in managerial roles and those working as therapy professionals also recorded higher likelihoods of CMD, with psychotropic prescription use (OR = 1.55: 1.07–2.25 and OR = 1.48: 1.01–2.15 respectively).

More generally, while self-reported mental health problems increased with age, minority ethnic status appears protective (OR = 0.41: 0.26–0.65 and OR = 0.56: 0.32–0.97 for females and males respectively when compared with their white peers), as does marriage and higher educational qualifications. Excess likelihoods were noted for those in rented housing (when compared against those in owner-occupation). Excess likelihoods were recorded for men in a lone parenting role and for women in an informal caring role (OR = 1.65: 1.12–2.42 and OR = 1.16: 1.02–1.33 respectively).

Factors associated with psychotropic medication for both men and women mostly follow the patterns described above: for example, marital status, household car access, and locale of residence; age and ethnicity. Excess likelihoods were recorded for women in a lone-parenting role (OR = 1.27: 1.17–1.37) and for both women and men in an informal caring role (OR = 1.15: 1.09–1.21 and OR = 1.18: 1.09–1.28 respectively). Finally, excess likelihoods were recorded for those in rented housing when compared with the most affluent owner-occupation (OR = 1.56: 1.35–1.79 and 1.51: 1.29–1.77 for women and men respectively).

Table 3 shows the sex-specific relationships between HSC occupation role and number of prescribed medications, firstly age-adjusted and then fully adjusted (with those receiving no medication as the reference category). For brevity and to allow focus, only the findings for HSC occupations are presented. The extended findings are available on request. For women, both the age-adjusted and fully adjusted models are consistent: nurses, welfare professionals and care workers show excess likelihoods across all prescription groups (with the exception of care workers receiving twenty or more). However, while women in HSC management roles show higher (age-adjusted) ORs this excess disappears on full adjustment. For men similar patterns were recorded: higher levels in nursing, welfare and caring occupations.

# Discussion

This study confirms evidence that people working in the caring sector are at higher risk of poor mental health outcomes when compared to other occupations. This is all the more compelling because we have obtained not only data on self-reported mental health problems but separately obtained administrative data on receipt of psychiatric medication. Investigations of the use of psychotropic drugs employing data from population-based studies are justified by the high and increasing prevalence of the consumption of these drugs in particular segments of society, especially anxiolytics and antidepressants [25]. However, we only note dispensed prescriptions and cannot identify usage or therapeutic drugs prescribed in the absence of mental illness. Importantly too, our findings show that even within health and social care, some jobs carry more risk of mental illness than others, with social care workers having exceptionally high levels of psychiatric medication compared to other health professions and the general population. Socioeconomic circumstances, unsurprisingly, were also associated with higher risk of mental health problems, as was lone-parent status and low educational attainment.

However, we additionally show that informal caregiving greatly increases the risk of mental health problems among

Table 1: Prevalence of (a) self-reported mental ill-health and (b) psychotropic prescription use (EPD, 2011–2012) across health and social care occupational classifications (recorded at the 2011 NI Census)

| Other professionals; and occupational classification across the HSC sector | Total study population % (n) | Self-reported mental ill-health % (n) | Psychotropic use: none % (n) | Psychotropic use: one % (n) | Psychotropic use: 2–3 % (n) | Psychotropic use: 4–9 % (n) | Psychotropic use: 10+ % (n) |
|---|---|---|---|---|---|---|---|
| **Other professional** | 60.74 (66,587) | 1.72 (1,145) | 87.83 (58,479) | 3.17 (2,108) | 2.31 (1,536) | 4.15 (2,762) | 2.56 (1,702) |
| **HSC Managers** | 0.93 (1,017) | 2.85 (29) | 78.17 (795) | 4.03 (41) | 4.62 (47) | 8.26 (84) | 4.92 (50) |
| **Healthcare** | 8.01 (8,779) | 1.16 (102) | 89.74 (7,878) | 2.80 (246) | 1.99 (175) | 3.52 (309) | 1.95 (171) |
| **Therapy** | 1.77 (1,935) | 1.09 (21) | 87.55 (1,694) | 3.51 (68) | 2.17 (42) | 4.08 (79) | 2.69 (52) |
| **Nurses/Midwives** | 11.52 (12,631) | 2.33 (294) | 80.54 (10,172) | 4.71 (595) | 3.49 (441) | 6.56 (828) | 4.71 (595) |
| **Welfare** | 3.50 (3,832) | 2.534 (97) | 79.78 (3,057) | 3.89 (149) | 4.33 (166) | 6.86 (263) | 5.14 (197) |
| **Formal carer** | 13.54 (14,846) | 2.88 (428) | 73.52 (10,913) | 6.02 (894) | 4.44 (659) | 8.78 (1,303) | 7.25 (1,077) |
| **Total: all** | 100 (109,627) | 1.93 (2,116) | 84.83 (92,988) | | 15.18 (16,639) | | |

Managers and proprietors in health and care services includes: Health care practice managers; Residential, day and domiciliary care managers and proprietors. Health professionals includes: Medical practitioners; Psychologists; Pharmacists; Ophthalmic opticians; Dental practitioners; Medical radiographers; Podiatrists. Therapy professionals includes: Physiotherapists; Occupational therapists; Speech and language therapists. Nursing and midwifery professionals includes: Nurses; Midwives. Welfare professionals' incudes: Social workers; Probation officers. Caring personal services includes: Nursing auxiliaries and assistants; Ambulance staff (excluding paramedics); Dental nurses; Houseparents' and residential wardens; Care workers and home carers; Senior care workers; Care escorts.

men and women, supporting earlier evidence on the challenges of caring [18]. There is a considerable body of evidence that family or informal caregivers are at high risk of stress and common mental disorders [26, 27]. However, variation in caregiving risk is often mediated by age, gender, relationship, condition and symptoms [28]. While we were unable to show which caregiver or care-receiver factors influence these outcomes, we could show that caregiving, independent of other major socioeconomic factors, contributes to poor mental health. We noted that minority ethnic status appears to be protective against mental health problems, with this finding on self-reported ill-health replicated in other studies [18]. This may reflect an emergent *healthy migrant* effect, that immigrants self-report a better health status than natives [29], or cultural differences related to stigma, explanatory models of mental illness or lower access to primary care [30].

Previous studies have shown that, regardless of age, those self-reporting poor mental health were more likely to redeem antidepressant prescriptions [31]. This contrasts with our study, where self-reported mental health status is derived from the census. Again, this may be the stigma of mental illness, deterring people from seeking medical help or access to non-medical treatment [31].

Work and personal relationships are central to daily life and powerfully influence well-being. It may be the case that health professionals because of their knowledge and expertise feel less stigmatised by mental illness and are therefore less inhibited to seek help and medication, compared to non-health sector. However, in the UK over the past decade the HSC workforce, their organisational setting and mental health outcomes, have received growing attention [5].

National Health Service (NHS) staff work under the impact of fiscal austerity and funding cuts, in services under intense pressure, with professional apprehensions about quality of care, patient safety and staff retention [32]. The NHS is the world's fifth largest employer with a workforce of 1.7 million, with reported sickness absence at 3–4% and over a quarter of staff illness attributable to mental ill-health [33]. An earlier UK based study reported that the prevalence of psychiatric disorder amongst health associated professionals was slightly lower than the average amongst all workers (11% compared to an overall prevalence of 13%). However, certain occupations within the healthcare sector had a higher prevalence of psychiatric disorder than expected, for example, nurse auxiliaries and care assistants [34].

More recently, data from the Second UK Survey of Psychiatric Morbidity amongst adults living in private households in Britain reported higher prevalence of CMD in occupations including primary and secondary teachers, welfare community, youth workers, security staff, waiters, bar staff, nurse auxiliaries and care assistants [3]. These occupations involve an emotional labour in working closely with the general public, including a degree of responsibility and unpredictability in personal interactions. High expectations from the public, risk of violence and verbal aggression can result in the professional masking their personal emotional needs to their detriment in terms of mental health [3]. Other studies have found that those working in minority, typically female dominated occupations such as teaching, healthcare and social work, are at increased risk of CMD. However, selection may account for this too [35]. Nevertheless, high levels of staff absence have important economic consequences and are negatively associated with healthcare service quality, including patient safety and effective patient care [33]. Dealing with this challenge across the NHS is parallel to analogous challenges existing around funding of HSC services [5, 6].

A possible explanation for higher CMD among those working in the HSC sector might relate to increased exposure to psychological distress, including role conflict, emotional labour, risk of medical error/litigation and strained relationships with patients/caregivers [36]. High job stress,

Table 2: Health and social care occupations (females and males separately)

| | Females | | | | | Males | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **population characteristics** | **study population** | **self-reported mental ill-health** | | **psychotropic medication** | | **study population** | **self-reported mental ill-health** | | **psychotropic medication** | |
| | N (%)[$] | *n* (%)[*] | OR (95% CI) | *n* (%) | OR (95% CI) | N (%)[$] | *n* (%)[*] | OR (95% CI) | *n* (%) | OR (95% CI) |
| **Health and Social Care occupations** | | | | | | | | | | |
| **Other professionals** | 28,301 (45.9) | *476 (1.7)* | 1.00 | *4,409 (15.6)* | 1.00 | 38,286 (79.8) | *669 (1.7)* | 1.00 | *3,699 (9.7)* | 1.00 |
| **Managers** | 798 (1.3) | | 1.23 (0.81-1.87) | *186 (23.3)* | 1.14 (0.96-1.36) | 219 (0.5) | | 0.74 (0.27-2.01) | *36 (16.4)* | **1.55 (1.07-2.25)** |
| **Healthcare** | 4,760 (7.7) | *70 (1.5)* | 1.14 (0.88-1.48) | *588 (12.4)* | 0.93 (0.85-1.02) | 4,019 (8.4) | *32 (0.8)* | 0.55 (0.37-0.80) | *313 (7.8)* | 0.92 (0.81-1.05) |
| **Therapy** | 1,653 (2.7) | | 0.76 (0.46-1.23) | *208 (12.5)* | 0.88 (0.76-1.03) | 282 (0.6) | | 0.81 (0.26-2.55) | *33 (11.7)* | **1.48 (1.01-2.15)** |
| **Nurses/Midwives** | 11,327 (18.4) | *265 (2.3)* | 1.17 (1.00-1.37) | *2,236 (19.2)* | **1.25 (1.17-1.33)** | 1,304 (2.7) | *29 (2.2)* | 1.13 (0.76-1.67) | *223 (17.1)* | **1.84 (1.58-2.15)** |
| **Welfare** | 2,816 (4.6) | | **1.35 (1.04-1.74)** | *599 (20.7)* | **1.34 (1.21-1.48)** | 1,016 (2.1) | | 1.06 (0.69-1.64) | *176 (17.3)* | **1.71 (1.44-2.03)** |
| **Formal carer** | 11,984 (19.4) | *328 (2.7)* | 0.91 (0.74-1.13) | *3,382 (27.1)* | **1.42 (1.31-1.53)** | 2,862 (6.0) | *100 (3.5)* | 1.08 (0.83-1.39) | *551 (19.3)* | **1.70 (1.50-1.91)** |
| **age group** | | | | | | | | | | |
| **20-24** | 4,526 (7.3) | *35 (0.8)* | 1.00 | *473 (10.5)* | 1.00 | 2,242 (4.7) | *17 (0.8)* | 1.00 | *127 (5.7)* | 1.00 |
| **25-29** | 10,520 (17.1) | *76 (0.7)* | 0.96 (0.64-1.45) | *1,219 (11.6)* | **1.28 (1.14-1.44)** | 5,977 (12.5) | *48 (0.8)* | 1.17 (0.66-2.08) | *364 (6.1)* | **1.16 (0.94-1.43)** |
| **30-34** | 10,055 (16.3) | *86 (0.9)* | 1.26 (0.83-1.90) | *1,421 (14.1)* | **1.71 (1.52-1.92)** | 7,236 (15.1) | *67 (0.9)* | 1.51 (0.86-2.65) | *548 (7.6)* | **1.66 (1.35-2.05)** |
| **35-39** | 8,441 (13.7) | *132 (1.6)* | **2.38 (1.60-3.54)** | *1,553 (18.4)* | **2.31 (2.05-2.61)** | 7,085 (14.8) | *78 (1.1)* | **1.92 (1.09-3.36)** | *695 (9.8)* | **2.49 (2.02-3.06)** |
| **40-44** | 7.947 (12.9) | *170 (2.1)* | **3.13 (2.11-4.63)** | *1,753 (22.1)* | **2.72 (2.41-3.07)** | 6,771 (14.1) | *103 (1.5)* | **2.78 (1.60-4.82)** | *729 (10.8)* | **2.74 (2.23-3.37)** |
| **45-49** | 7,959 (12.9) | *218 (2.7)* | **3.87 (2.62-5.70)** | *1,997 (25.1)* | **2.96 (2.62-3.34)** | 6,187 (12.9) | *118 (1.9)* | **3.24 (1.87-5.63)** | *837 (13.5)* | **3.51 (2.85-4.32)** |
| **50-54** | 7,188 (11.7) | *281 (3.9)* | **5.67 (3.86-8.34)** | *1,881 (26.2)* | **3.17 (2.80-3.58)** | 5,595 (11.7) | *149 (2.7)* | **4.72 (2.73-8.16)** | *753 (13.5)* | **3.53 (2.86-4.36)** |
| **55-59** | 5,003 (8.1) | *256 (5.1)* | **7.55 (5.1-11.14)** | *1,311 (26.2)* | **3.19 (2.81-3.63)** | 4,484 (9.3) | *160 (3.6)* | **6.81 (3.94-11.77)** | *628 (14.0)* | **3.88 (3.13-4.81)** |
| **60-64** | | | | | | 2,411 (5.0 ) | *122 (5.1)* | **9.26 (5.30-16.15)** | *350 (14.5)* | **3.99 (3.18-5.01)** |
| **ethnicity** | | | | | | | | | | |
| **White** | 59,643 (96.8) | *1,234 (2.1)* | 1.00 | *11,455(19.2)* | 1.00 | 46,368(96.6) | *848 (1.8)* | 1.00 | *4,948 (10.7)* | 1.00 |
| **non-white** | 1,996 (3.2) | *20 (1.0)* | **0.41 (0.26-0.65)** | *153 (7.7)* | **0.27 (0.23-0.33)** | 1,620 (3.4) | *14 (0.9)* | **0.56 (0.32-0.97)** | *83 (5.1)* | **0.34 (0.27-0.42)** |
| **marital status** | | | | | | | | | | |
| **Married** | 33,511 (54.4) | *672 (2.0)* | 1.00 | *6,113 (18.2)* | 1.00 | 31,423(65.5) | *551 (1.8)* | 1.00 | *3,120 (9.9)* | 1.00 |
| **Never married** | 21,956 (35.6) | *316 (1.4)* | 1.09 (0.92-1.29) | *3,482 (15.9)* | 1.01 (0.95-1.07) | 14,085(29.4) | *207 (1.5)* | **1.27 (1.04-1.56)** | *1,447 (10.3)* | **1.35 (1.24-1.47)** |
| **Sep-Div-Wid** | 6,172 (10.0) | *266 (4.3)* | **1.28 (1.06-1.56)** | *2,013 (32.6)* | **1.20 (1.11-1.30)** | 2,480 (5.2) | *104 (4.2)* | **1.40 (1.08-1.80)** | *464 (18.7)* | **1.39 (1.23-1.58)** |
| **lone parent** | | | | | | | | | | |
| **No** | 56,349 (91.4) | *1,077 (1.9)* | 1.00 | *9,957 (17.7)* | 1.00 | 47,283 (98.5) | *826 (1.8)* | 1.00 | *4,909 (10.4)* | 1.00 |
| **Yes** | 5,290 (8.6) | *177 (3.4)* | 1.02 (0.83-1.25) | *1,651 (31.2)* | **1.27 (1.17-1.37)** | 705 (1.5) | *36 (5.1)* | **1.65 (1.12-2.42)** | *122 (17.3)* | 0.97 (0.78-1.21) |
| **household car access** | | | | | | | | | | |
| **No car** | 2,920 (4.7) | *105 (3.6)* | 1.00 | *844 (28.9)* | 1.00 | 2,121 (4.4) | *62 (2.9)* | 1.00 | *419 (19.8)* | 1.00 |
| **2+ cars** | 40,451 (65.6) | *709 (1.8)* | **0.66 (0.51-0.84)** | *6,715 (16.6)* | **0.68 (0.61-0.75)** | 33,763(70.4) | *533 (1.6)* | **0.64 (0.46-0.87)** | *3,125 (9.3)* | **0.53 (0.46, 0.60)** |
| **One car** | 18,268 (29.6) | *440 (2.4)* | **0.74 (0.59-0.94)** | *4,049 (22.2)* | **0.78 (0.71-0.86)** | 12,104(25.2) | *267 (2.2)* | **0.72 (0.53-0.97)** | *1,487 (12.3)* | **0.58 (0.51-0.67)** |
| **locale of residence** | | | | | | | | | | |
| **Urban** | 12,076 (19.6) | *247 (2.1)* | 1.00 | *2,232 (18.5)* | 1.00 | 11,237(23.4) | *200 (1.8)* | 1.00 | *1,234 (11.0)* | 1.00 |
| **Intermediate** | 31,911 (51.8) | *675 (2.1)* | 1.02 (0.88-1.19) | *6,501 (20.4)* | **1.07 (1.01-1.13)** | 24,592(51.3) | *455 (1.9)* | 0.98 (0.82-1.17) | *2,696 (11.0)* | 1.04 (0.97-1.13) |
| **Rural** | 17,652 (28.6) | *332 (1.9)* | 1.05 (0.87-1.25) | *2,875 (16.3)* | **0.92 (0.86-0.99)** | 12,159(25.3) | *207 (1.7)* | 0.99 (0.80-1.22) | *1,101 (9.1)* | 0.94 (0.86-1.04) |
| **tenure/rateable value of property** | | | | | | | | | | |
| **OO: £160,000+ %** | 2,175 (3.6) | *36 (1.7)* | 1.00 | *316 (14.5)* | 1.00 | 3,247 (6.8) | *36 (1.1)* | 1.00 | *292 (9.0)* | 1.00 |
| **OO: £115K-159,999** | 7,525 (12.6) | *147 (2.0)* | 1.26 (0.87-1.82) | *1,178 (15.7)* | 1.08 (0.94-1.24) | 7,996 (16.7) | *120 (1.5)* | 1.38 (0.94-2.02) | *675 (8.4)* | 0.94 (0.81-1.09) |
| **OO: £90K-115,999** | 10,382 (17.4) | *184 (1.8)* | 1.15 (0.80-1.66) | *1,816 (17.5)* | **1.18 (1.03-1.35)** | 9,186 (19.1) | *166 (1.8)* | **1.67 (1.15-2.43)** | *915 (10.0)* | 1.11 (0.96-1.28) |
| **OO: £70K-90,000** | 16,290 (27.3) | *323 (2.0)* | 1.37 (0.96-1.96) | *2,927 (18.0)* | **1.18 (1.03-1.34)** | 11,460(23.9) | *199 (1.7)* | **1.65 (1.13-2.39)** | *1,181 (10.3)* | 1.15 (0.99-1.32) |
| **OO: < £70,000** | 13,718(23.0) | *293 (2.1)* | **1.52 (1.05-2.20)** | *2,949 (21.5)* | **1.37 (1.20-1.56)** | 7,665 (16.0) | *178 (2.3)* | **2.17 (1.48-3.20)** | *901 (11.8)* | **1.25 (1.07-1.46)** |
| **Renting** | 9,548 (16.0) | *241 (2.5)* | **2.12 (1.45-3.12)** | *2,122 (22.2)* | **1.56 (1.35-1.79)** | 6,959 (14.5) | *136 (2.0)* | **1.83 (1.22-2.74)** | *944 (13.6)* | **1.51 (1.29-1.77)** |
| **highest educational qualification** | | | | | | | | | | |
| **High** | 48,511 (78.7) | *869 (1.8)* | 1.00 | *7,938 (16.4)* | 1.00 | 40,258(84.0) | *605 (1.5)* | 1.00 | *3,910 (9.7)* | 1.00 |
| **Low** | 1,596 (2.6) | *82 (5.1)* | **1.58 (1.18-2.12)** | *559 (35.0)* | **1.34 (1.18-1.52)** | 689 (1.4) | *46 (6.7)* | **2.55 (1.80-3.62)** | *136 (19.7)* | 1.14 (0.93-1.41) |
| **Intermediate** | 11,532(18.7) | *303 (2.6)* | 1.18 (0.98-1.43) | *3,111 (27.0)* | **1.29 (1.20-1.38)** | 7,041 (14.7) | *211 (3.0)* | **1.62 (1.35-1.94)** | *985 (14.0)* | **1.18 (1.08-1.28)** |
| **informal carer** | | | | | | | | | | |
| **No** | 49,921 (81.0) | *918 (1.8)* | 1.00 | *8,894 (17.8)* | 1.00 | 41,034(85.5) | *692 (1.7)* | 1.00 | *4,098 (10.0)* | 1.00 |
| **Yes** | 11,718 (19.0) | *336 (2.9)* | **1.16 (1.02-1.33)** | *2,714 (23.2)* | **1.15 (1.09-1.21)** | 6,954 (14.5) | *170 (2.4)* | 1.12 (0.94-1.34) | *933 (13.4)* | **1.18 (1.09-1.28)** |

Likelihoods of (a) self-reported chronic mental health problems at the 2011 Census and (b) receipt of psychotropic prescriptions in the twelve months following the Census. Data represents: included populations; number and proportions of each included group (a) self-reporting mental health problems and (b) receiving prescriptions; and Odds Ratios (ORs) and 95% Confidence Intervals for fully adjusted logistic regression models.

$: percentages represents the proportion of the associated group with the whole population (column percentages).

*: Because of small numbers (counts of less than ten) some rows with results missing are classed as potentially disclosive.

%: this group includes a category 'OO: no rateable value yet determined' which, while included to allow for analyses of the whole study population, is not reported as it contains no *useful* information. For this group the rateable values are assumed to be distributed randomly over all the owner occupation categories.

low reward and moral injury have led to staffing shortages which contribute to increased stress across HSC professions due to fragmentation of responsibility for workforce issues at a national level; poor workforce planning; cuts in training place funding; insecurities surrounding potentially restrictive immigration policies exacerbated by Brexit rhetoric; and high levels of healthcare providers leaving their jobs prematurely. Staff shortages increase workload for those remaining and,

Table 3: Health and social care occupations and the likelihood for psychotropic prescriptions in the 12 months following the Census

| Cohort characteristics | | One Psychotropic prescriptions OR (95% CI) | 2-3 Psychotropic prescriptions OR (95% CI) | 4-9 Psychotropic prescriptions OR (95% CI) | 10-19 Psychotropic prescriptions OR (95% CI) | 20+ Psychotropic prescriptions OR (95% CI) |
|---|---|---|---|---|---|---|
| **Males** | Other Professional | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** |
| **Health &** | Managers | 1.74 (0.92-3.30) | 1.48 (0.65-3.36) | 1.42 (0.77-2.63) | 1.79 (0.79-4.06) | 2.21 (0.70-6.97) |
| **Social Care** | Health Professionals | 0.96 (0.78-1.18) | 0.78 (0.59-1.03) | 0.73 (0.59-0.90) | 0.73 (0.54-1.00) | 0.68 (0.41-1.11) |
| **workforce:** | Therapy Professionals | 1.39 (0.71-2.72) | 0.69 (0.22-2.17) | 1.68 (0.95-2.94) | 1.72 (0.76-3.89) | 1.24 (0.31-5.04) |
| **Age adjusted** | Nurses/Midwives | **2.00 (1.53-2.61)** | 1.38 (0.95-2.00) | **1.77 (1.39-2.27)** | **2.14 (1.53-2.99)** | **2.77 (1.76-4.35)** |
| | Welfare Professionals | **1.45 (1.03-2.04)** | **1.91 (1.34-2.73)** | **1.78 (1.36-2.34)** | **2.67 (1.90-3.74)** | **1.85 (1.01-3.40)** |
| | Care Workers | **2.13 (1.77-2.56)** | **1.85 (1.46- 2.33)** | **2.03 (1.71-2.39)** | **3.10 (2.53-3.81)** | **2.84 (2.05-3.94)** |
| **Males** | Other Professional | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** |
| **Health &** | Managers | 1.66 (0.87-3.17) | 1.27 (0.52-3.10) | 1.43 (0.77-2.65) | 1.72 (0.76-3.93) | 2.20 (0.69-7.01) |
| **Social Care** | Health Professionals | 1.01 (0.81-1.26) | 0.87 (0.65-1.15) | 0.85 (0.68-1.05) | 1.01 (0.73-1.40) | 0.95 (0.56-1.59) |
| **workforce:** | Therapy Professionals | 1.33 (0.65-2.70) | 0.77 (0.24-2.40) | **1.82 (1.03-3.21)** | 1.93 (0.85-4.38) | 1.38 (0.34-5.64) |
| **Fully adjusted** | Nurses/Midwives | **1.92 (1.46-2.53)** | 1.41 (0.96-2.06) | **1.80 (1.40-2.31)** | **2.03 (1.44-2.86)** | **2.34 (1.47-3.73)** |
| | Welfare Professionals | **1.42 (1.01-2.00)** | **1.85 (1.29-2.66)** | **1.67 (1.26-2.20)** | **2.12 (1.49-3.02)** | 1.58 (0.85-2.93) |
| | Care Workers | **1.57 (1.27-1.95)** | **1.71 (1.30-2.24)** | **1.64 (1.35-2.00)** | **2.01 (1.55-2.59)** | **1.67 (1.11-2.50)** |
| **Females** | Other Professional | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** |
| **Health &** | Managers | 0.95 (0.66-1.37) | 1.61 (1.17-2.23) | 1.50 (1.17-1.93) | 1.63 (1.15-2.32) | 0.75 (0.33-1.69) |
| **Social Care** | Health Professionals | 0.79 (0.66-0.95) | 0.87 (0.72-1.06) | 0.92 (0.80-1.07) | 0.82 (0.65-1.03) | 0.86 (0.58-1.26) |
| **workforce:** | Therapy Professionals | 0.92 (0.70-1.20) | 0.82 (0.59-1.14) | 0.82 (0.64-1.06) | 1.04 (0.74-1.46) | 0.65 (0.32-1.33) |
| **Age adjusted** | Nurses/Midwives | **1.19 (1.07-1.32)** | **1.20 (1.06-1.35)** | **1.21 (1.11-1.33)** | **1.45 (1.28-1.65)** | **1.39 (1.13-1.72)** |
| | Welfare Professionals | 1.07 (0.88-1.31) | **1.66 (1.37-2.00)** | **1.43 (1.23-1.67)** | **1.76 (1.43-2.16)** | **1.69 (1.19-2.38)** |
| | Care Workers | **1.83 (1.66-2.01)** | **1.84 (1.65-2.05)** | **2.03 (1.87-2.21)** | **2.75 (2.46-3.08)** | **2.88 (2.40-3.45)** |
| **Females** | Other Professional | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** |
| **Health &** | Managers | 0.82 (0.56-1.21) | 1.30 (0.91-1.84) | 1.30 (1.00-1.69) | 1.38 (0.96-1.97) | 0.53 (0.23-1.20) |
| **Social Care** | Health Professionals | 0.81 (0.67-0.97) | 0.93 (0.77-1.14) | 1.00 (0.86-1.17) | 0.93 (0.74-1.18) | 1.05 (0.71-1.54) |
| **workforce:** | Therapy Professionals | 0.94 (0.71-1.23) | 0.83 (0.60-1.16) | 0.82 (0.63-1.06) | 1.06 (0.76-1.50) | 0.69 (0.34-1.41) |
| **Fully adjusted** | Nurses/Midwives | **1.20 (1.07-1.34)** | **1.20 (1.06-1.36)** | **1.22 (1.11-1.34)** | **1.44 (1.26-1.64)** | **1.29 (1.03-1.61)** |
| | Welfare Professionals | 1.04 (0.85-1.27) | **1.53 (1.27-1.86)** | **1.32 (1.13-1.54)** | **1.58 (1.28-1.94)** | **1.45 (1.02-2.06)** |
| | Care Workers | **1.41 (1.22-1.62)** | **1.36 (1.16-1.59)** | **1.46 (1.30-1.65)** | **1.61 (1.37-1.90)** | 0.99 (0.77-1.29) |

with on-going staffing deficiencies, patient waiting lists will increase and quality of care diminish.

## Conclusion

Protecting the mental health of those working in HSC is imperative, and career appropriate support should be available [37] to improve job-related difficulties [38]. High staff turnover is associated with mental ill-health [39] and is detrimental to budget maintenance in medical institutions [40]. The trends in psychotropic treatment might represent over-prescribing and lack of access to psychological therapies. Psychotropic medication uptake within the workplace in the absence of self-report might be stigma-related. Furthermore, self-reported mental illness and lack of psychotropic treatment appears to be associated with socioeconomic inequity. It might be argued that these are contextual issues. First, different from other UK jurisdictions, HSC is integrated in NI. However, while integrated care should be beneficial to staff, evidence of high levels of CMD presented here suggests otherwise. According to the recent Bengoa Report [41] recommendations to improve workforce strategy have not yet been adequately implemented. Cutbacks in funding are also blamed for a lack of progress on full implementation of earlier Bamford recommendations and roll-out of good practice initiatives across NI. Organisational context is an important contributor to the uptake of psychotropic medication among employees. Policy-makers should consider how to implement organisational change in the workplace, providing appropriate interventions and improving conditions that currently may pose risks for employee mental health.

## Strengths and limitations

We extend the current evidence base by identifying patterns in both psychotropic medication (EPD) prescription and use, and self-reported mental ill-health (derived from Census self-reports of chronic conditions). While evidence on the validity of self-reported Census data is limited, earlier validation studies indicate self-report to be a fairly accurate measure [42] and one deemed valid for estimating population health. Through the inclusion of EPD data, our approach accounted for previous self-report bias, a characteristic of many population surveys. However, we acknowledge that the EPD is an administrative data source, collected for reasons other than research and that, consequently, will not include information other than that prescriptions have been dispensed. Lastly, our study lacks much contextual work data such as work overload, exposure to

bullying and management styles: given the sources used such data was not available.

## Acknowledgement

The Administrative Data Research Network takes privacy protection very seriously. All information directly identifying individuals is removed from the datasets by trusted third parties, before researchers get to see it. All researchers using the Network are trained and accredited to use sensitive data safely and ethically, they will only access the data via a secure environment, and all of their findings will be vetted to ensure they adhere to the strictest confidentiality standards. The help provided by the staff of the Administrative Data Research Network Northern Ireland (ADR-NI) and the Northern Ireland Statistics and Research Agency (NISRA) Research Support Unit is acknowledged. The ADR-NI is funded by the Economic and Research Council (ESRC). The authors alone are responsible for the interpretation of the data and any views or opinions presented are solely those of the author and do not necessarily represent those of the ADR-NI. The Health and Social Care Business Services Organisation (HSC-BSO) prescriptions data has been supplied for the sole purpose of this project.

## Ethics Statement

This administrative data study was granted ethical approval by the Proportionate Review Sub-committee of the East Midlands - Leicester South Research Ethics Committee on 08 February 2018. REC reference: 18/EM/0053; IRAS project ID: 236419.

## Conflict of interest Statement

The authors declare that they have no conflict of interest.

## Disclosure statement

Ethical Approval of Research: NHS Health Research Authority East Midlands - Leicester South Research Ethics Committee; REC reference: 18/EM/0053 IRAS project ID: 236419; Granted: 08 February 2018. Registry and the Registration No. of the study/Trial: N/A; Informed Consent: N/A; Animal Studies: N/A; Conflict of Interest: N/A

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